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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,491	01/09/2006	Takashi Okamoto	H&A-136	5494

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EXAMINER	
GIMIE, MAHMOUD	
ART UNIT	**PAPER NUMBER**
3747	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,491	OKAMOTO ET AL.	
	Examiner	Art Unit	
	Mahmoud Gimie	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/25/5; 12/20/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 19-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 19-23 recites the limitation "direct injection" in line 2 of each claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-11 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Yunoki et al. (JP-8303325).

Yunoki et al. disclose a control device (18) of a high-pressure fuel pump (1) of an internal combustion engine having a fuel injection valve provided on a cylinder and the high- pressure fuel pump (1) for pumping fuel to said fuel injection valve, characterized in that said high-pressure fuel pump comprises: a pressure chamber (3); a plunger (7) for pressurizing the fuel in said pressure chamber; a fuel valve (15) provided in said pressure chamber (3); and an actuator (11) for operating said fuel valve (15), and

characterized in that said control device (18) has means for calculating a drive signal of said actuator (11) so as to realize the variable discharge of said high-pressure fuel pump, and that means for calculating said drive signal has means for limiting end timing of the drive signal of said actuator to a predetermined phase (before top dead center, see abstract).

Regarding claim 2, the means for limiting to said predetermined phase limits end timing of a drive signal of said actuator to be prior to top dead center of said plunger (see figure 2).

Regarding claim 3, characterized in that the means for limiting to said predetermined phase calculates the end timing of a drive signal of said actuator through the use of at least one of a number of revolutions of the engine, injection quantity from said fuel injection valve, battery voltage and coil resistance.

Regarding claim 4, characterized in that the means for limiting to said predetermined phase is an electronic circuit (18).

Regarding claim 5, characterized in that when the end timing of a drive signal of said actuator (11) is limited to said predetermined phase, at least one of injection quantity from said fuel injection valve, fuel injection timing and ignition timing is changed and controlled.

Regarding claim 6, Yunoki et al. disclose a control device of a high-pressure fuel pump of an internal combustion engine having a fuel injection valve provided on a cylinder and a high- pressure fuel pump for pumping fuel to said fuel injection valve, characterized in that said high-pressure fuel pump (1) comprises: a pressure chamber (3); a plunger (7)

for pressurizing the fuel in said pressure chamber; a fuel valve (15) provided in said pressure chamber; and an actuator for operating said fuel valve, and characterized in that said control device has means for calculating a drive signal of said actuator so as to realize the variable discharge of said high-pressure fuel pump, and that means for calculating said drive signal has means for not outputting said drive signal when output timing of said drive signal of said actuator is a predetermined phase and thereafter.

Regarding claim 7, characterized in that when said drive signal has not been outputted, at least one of injection quantity from said fuel injection valve, fuel injection timing, and ignition timing is changed and controlled.

Regarding claim 8, Yunoki et al. disclose a control device of a high-pressure fuel pump of a direct injection internal combustion engine having a fuel injection valve provided on a cylinder and a high-pressure fuel pump for pumping fuel to said fuel injection valve, characterized in that said high-pressure fuel pump comprises: a pressure chamber; a plunger for pressurizing the fuel in said pressure chamber; a fuel valve provided in said pressure chamber; and an actuator for operating said fuel valve, and characterized in that said control device has means for calculating a drive signal of said actuator so as to realize the variable discharge of said high-pressure fuel pump, and that the means for calculating said drive signal has means for limiting the output timing of a drive signal of said actuator to be within a predetermined phase range.

Regarding claim 9, characterized in that the means for limiting to be within said predetermined phase range limits output timing of a drive signal of said actuator to a point of time whereat we went back to the past from the bottom dead center of said

plunger by a time period corresponding to said actuator operating time period, and thereafter.

Regarding claim 10, characterized in that the means for limiting to be within said predetermined phase range limits the output timing of a drive signal of said actuator to be within a point of time whereat said plunger arrives at the top dead center, see figure 2.

Regarding claim 18, the means for limiting to be within said predetermined phase range is an electronic circuit, see figure 2.

Allowable Subject Matter

6. Claims 12-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 19-23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited references disclose high-pressure fuel pump controls.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahmoud Gimie whose telephone number is 571-272-

4841. The examiner can normally be reached on Monday-Friday between 7 a.m. -3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen K. Cronin can be reached on 571-272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MG

MAHMOUD GIMIE
PRIMARY EXAMINER